

CLAIMS

1. A magnetic recording medium which comprises a substrate, an orientation control layer formed thereon, and a Co alloy magnetic layer formed thereon directly or indirectly with a Cr underlayer or Cr alloy underlayer interposed between them, said orientation control layer containing at least Ti in an amount not less than 35 at.% and not more than 65 at.% and Al in an amount not less than 35 at.% and not more than 65 at.%.

2. A magnetic recording medium as defined in Claim 1, wherein the orientation control layer substantially has the L10-type (AuCu I-type) crystal structure.

3. A magnetic recording medium which comprises a substrate, an orientation control layer formed thereon, and a Co alloy magnetic layer formed thereon directly or indirectly with a Cr underlayer or Cr alloy underlayer interposed between them, said orientation control layer having the crystal structure substantially of L10-type (AuCu I-type).

4. A magnetic recording medium as defined in any of Claims 1 to 3, wherein the underlayer is that of double-layer structure which consists of a first underlayer made of Cr and a second underlayer which is formed on the first underlayer containing at least one species of element selected from Cr, Nb, Mo, Ta, W, and Ti.

5. A magnetic recording medium as defined in any of Claims 1

099447-082904

Sub D1

to 4, which has an intermediate layer between the magnetic layer and the underlayer, said intermediate layer being made of a material containing Co and not less than 25 at.% Cr.

6. A magnetic recording medium which comprises a substrate, an orientation control layer formed thereon, and a Co alloy magnetic layer formed thereon with a Cr underlayer or Cr alloy underlayer interposed between them, said orientation control layer containing at least one element selected from group A (consisting of Ni and Co) in an amount of from 30 at.% to 60 at.%, Al in an amount from 20 at.% to 30 at.%, and one element selected from group B (consisting of Ti and Zr) in an amount from 20 at.% to 30 at.%.

7. A magnetic recording medium as defined in Claim 6, wherein the orientation control layer substantially has the L21-type ( $\text{Cu}_2\text{AlMn}$  type) crystal structure.

8. A magnetic recording medium which comprises a substrate, an orientation control layer formed thereon, and a Co alloy magnetic layer formed thereon directly or indirectly with a Cr underlayer or Cr alloy underlayer interposed between them, said orientation control layer having the crystal structure substantially of L21-type ( $\text{Cu}_2\text{AlMn}$  type).

9. A magnetic recording medium as defined in any of Claims 6 to 8, wherein the underlayer is that of double-layer structure which consists of a first underlayer made of Cr and a second under-

00914471-002901

Sub  
Cont

layer which is formed on the first underlayer containing at least one species of element selected from Cr, Nb, Mo, Ta, W, and Ti.

10. A magnetic recording medium as defined in any of Claims 6 to 9, which has an intermediate layer between the magnetic layer and the underlayer, said intermediate layer being made of a material containing Co and not less than 25 at.% Cr.

11. A magnetic recording medium which comprises a substrate, an orientation control layer formed thereon, and a Co alloy magnetic layer formed thereon with a Cr underlayer or Cr alloy underlayer interposed between them, said orientation control layer containing at least one species of element selected from Al, Cu, Rh, Pd, Ag, Ir, Pt, and Au in an amount not less than 70 at.%.

12. A magnetic recording medium as defined in Claim 11, wherein the orientation control layer substantially has the fcc crystal structure.

13. A magnetic recording medium which comprises a substrate, an orientation control layer formed thereon, and a Co alloy magnetic layer formed thereon directly or indirectly with a Cr underlayer or Cr alloy underlayer interposed between them, said orientation control layer having the crystal structure substantially of fcc type.

14. A magnetic recording medium as defined in any of Claims 11 to 13, wherein the underlayer is that of double-layer structure

TOP SECRET

Sub D1  
Cov

which consists of a first underlayer made of Cr and a second underlayer which is formed on the first underlayer containing at least one species of element selected from Cr, Nb, Mo, Ta, W, and Ti.

15. A magnetic recording medium as defined in any of Claims 11 to 14, which has an intermediate layer between the magnetic layer and the underlayer, said intermediate layer being made of a material containing Co and not less than 25 at.% Cr.

16. A magnetic recording medium which comprises a substrate, an orientation control layer formed thereon, and a Co alloy magnetic layer formed thereon with a Cr underlayer or Cr alloy underlayer interposed between them, said orientation control layer having the B2 (CsCl) crystal structure incorporated with at least B.

17. A magnetic recording medium as defined in Claim 16, in which the content of B in the orientation control layer is not less than 0.05 at.% and not more than 15 at.%.

18. A magnetic recording medium as defined in Claims 16 and 17, in which the orientation control layer is made of an alloy whose principal component is at least one kind of alloy selected from Al-Co, Al-Fe, Al-Ni, Al-Pd, Co-Ga, Co-Fe, Co-Ti, Cu-Pd, Cu-Zn, Ga-Ni, Ga-Rh, and Ru-Si.

19. A magnetic recording medium as defined in any of Claims 16 to 18, wherein the underlayer is that of double-layer structure which consists of a first underlayer made of Cr and a second under-

09914474033004

Sub B7  
Cord 17

~~20. A magnetic recording medium as defined in any of Claims 16 to 19, which has an intermediate layer between the magnetic layer and the underlayer, said intermediate layer being made of a material containing Co and not less than 25 at.% Cr.~~

21. A magnetic storage device having a magnetic recording medium, a driver to turn said magnetic recording medium in the recording direction, a magnetic head consisting of a recording element and a read-back element, a means to move said magnetic head relative to said magnetic recording medium, and a record-read signal processing means to perform waveform processing on input signals to and output signals from said magnetic head, wherein said magnetic recording medium is the magnetic recording medium defined in any of Claims 1 to 20 and the read-back element of said magnetic head is that of magnetoresistive effect type.